

X.—*On some Mammals from Tenasserim.*—By W. T. BLANFORD, F. R. S.

(Received and read March 6th, 1878.)

(With Plates VI, VII, VIII.)

The mammals described in the following notes are from two collections. The first and largest was made by Mr. W. Davison for Mr. Hume, to whom I am indebted for the specimens; the second, which although smaller, comprised several very interesting forms, was collected by Mr. Limborg. The bats procured by the latter have already been described by Mr. Dobson.*

The localities, and, in almost every case, the sexes have been carefully recorded on the specimens obtained by both the naturalists named. Mr. Davison's labels in many cases contain detailed measurements taken before skinning. As will be seen, several important additions are made to the Tenasserim fauna, and the most of these are from B nkas n in Southern Tenasserim, where some Malay forms have been obtained, which had not previously been noticed so far north.

In addition to the Tenasserim specimens, Mr. Hume has very kindly given to me a large portion of his mammalian collection, and has entrusted me with the whole for examination and description.

INSECTIVORA.

Gymnura rafflesi.

Vigors and Horsfield, Zool. Jour. III, p. 246;—Wagner, Schreber's S ugth. Supp. II, p. 46; V, p. 534.

This species was mentioned in Mr. Blyth's list of the mammals of Burma, † as probably existing in Mergui, although its occurrence within British limits had not been recorded. It has since been obtained at B nkas n in Southern Tenasserim, by Mr. Davison, to whom I am indebted for a perfect female in spirit. The anatomy of the animal is almost unknown, but I hope to induce a more competent anatomist than I am to examine the specimen.

The skins from B nkas n vary much in the extent of white on the fore part of the body. Generally the head and neck are white with the exception of a broad black patch above each eye and a variable amount of black bristles mixed with white on the crown. The anterior portion of the back is clad with mixed white and black bristles, the proportion varying; on the hinder back, sides, limbs and lower parts from the breast, the long hairs are generally black, but in one specimen there is a line of white bristles down the middle of the breast and belly; this line is wanting in the other two

* J. A. S. B. 1877, Pt. 2, p. 312.

† J. A. S. B. 1875, Pt. 2, extra number, p. 32.

skins which I have examined. The extent of the white varies so much that it is not at all improbable that specimens wholly white or wholly black may occur. The fine woolly under fur is dusky olivaceous at the base, brown at the tips on the upper parts, ashy with brownish ends beneath. The terminal portion of the tail is compressed, and in some specimens partially or wholly white in colour, and the under surface of the tail is thinly clad throughout with scattered short bristles, about a quarter of an inch long. These bristles are wanting on the upper part of the tail, which has very much shorter scattered hairs. The small scales covering the tail are indistinctly arranged in rings, and subimbricate; on the lower surface the scales are convex and distinctly imbricate, the bristles arising from the interstices. Thus the under surface of the tail is very rough and may probably be of use to the animal in climbing.

The characters of the tail just mentioned do not appear to have been noticed in the published descriptions of *Gymnura*, all of which are probably copied from that by Horsfield and Vigors. Another important difference from the original account is to be found in the claws of the specimens before me not being retractile. In the original description* the retractility of the claws is mentioned, both in the Latin characters and in the English note pointing out the distinctions between *Gymnura* and *Tupaia*. It is possible that the Tenasserim animal differs from that found in Sumatra, but the distinction between retractile and non-retractile claws would in all probability be of generic importance, and it is difficult to conceive that two genera of insectivora, so closely resembling each other in their very peculiar external characters, and yet differing in so important a detail, should inhabit two regions of which the fauna is, for the most part, identical. At the same time it is possible that I am mistaken in referring the Tenasserim animal to *Gymnura rafflesi*.

The following are the dimensions of the female specimen in spirit—
inches.

Length from nose to anus,	12
„ of tail,	8·5
„ of ear from orifice,	0·94
„ of tarsus and hind foot (claws not included),	2·15

The stuffed specimen is nearly the same, except that the tail is rather longer. The dimensions given by Horsfield and Vigors for an adult are rather more;—head and body 14·25 inches, tail 10·5, whilst the tarsus is stated to be only 2 inches long, but the difference is trifling.

Mr. Davison informs me that *Gymnura* is purely nocturnal in its habits, and lives under the roots of trees. It has a peculiar and most offensive smell, not musky, but rather alliaceous, resembling decomposed cooked

* Zool. Jour., III, p. 248.

vegetables. There is a slight smell in the dried skin. The contents of the stomach in the spirit specimen appear to consist entirely of remains of insects, amongst which I can, I think, detect termites, but most of the fragments are too much broken for identification.

Tupaia peguana.

Jerdon, Mam. Ind. No. 88 :—Blyth Mam. Burm. No. 65.

Blyth in his Catalogue of the Mammalia in the Museum of the Asiatic Society classed the Peguan *Tupaia* as a variety of *T. ferruginea*, but in his Mammals of Burma he separated the Burmese species, as Jerdon had done. He, however, pointed out that the two are barely separable, and that a ferruginous tinge is present in some Burmese specimens.

Skins collected by Mr. Davison in Southern Tenasserim have all the posterior portion of the back distinctly ferruginous. Others from Myáwadi, west of Moulmain, are almost equally rufous on the rump, whilst other specimens again from the same neighbourhood have no rufous tinge. A specimen from Tavoy has scarcely a trace of rufescent. Without a larger series of Malaccan specimens than I have at hand, I cannot positively say that the two forms pass into each other, but I am strongly disposed to suspect that they do so.

The following dimensions taken on the animals when recently killed are recorded by Mr. Davison on his tickets.

	1 ♂ ad.	2 ♂ ad.	3 ♀
Nose to anus,	6·8	6·8	6·6
Tail from anus,.....	7·	6·8	6·4
Hairs at end of tail,	1·1	1·2	0·8
	Total	14·9	14·8
Length of fore foot (claws excluded),.....	0·88	1·	0·9
,, hind foot (,,),	1·65	1·75	1·69
,, of ear externally,.....	0·3	0·2	0·35
,, inside from orifice,	0·6	0·55	0·45
Breadth of ear laid flat,.....	0·8	0·7	0·6

No. 1 is from Kaukaryit on the Hougdarau river, 2 and 3 from the neighbourhood of Myáwadi, all localities to the eastward of Moulmain.

CARNIVORA.

Prionodon maculosus, Pls. VI, VII.

W. Blanf. Proc. As. Soc. Bengal, March 1878, p. 93.

P. affinis P. gracili, sed major, atque maculis fasciisque fuscis majoribus ornatus; dorso nigrescenti-fusco, lineis sex albis angustis transfasciato, fasciá albá laterali utrinque post aurem oriente, usque ad femorem decur-

rente, lateribus maculis longis fuscis superne majusculis, subtus minoribus signatis, collo sursum duobus fasciis latis subnigris longitudinalibus, inter se vittâ albâ angustâ, medio fusco-lineatâ, discretis, notato; caudâ annulis septem fuscis albisque alternis circumdatâ, illis fere duplo latioribus, apice albescente.

Long. a rostro ad anum 18·25, caudæ sine pilis ad apicem 16, pilorum 0·75, tota 35; cranii 3, tarsi a calcaneo 2·8 poll. angl.

Hab. in provinciâ Tenasserim, (Davison, Limborg).

Upper part brownish black broken up by greyish white bands, lower parts white, tail brownish black with 7 white rings, tip whitish. Two broad black bands run down each side of the upper part of the neck, between them is a narrow greyish white band with a faint mesial dark streak, somewhat interrupted, and passing into two bands of elongate spots between the shoulders. The two broad dark bands pass into the dark patches of the back; on each side of these bands is a white rather wavy stripe, commencing at the ear and continued along the neck, above the shoulder, and down the side to the thighs, becoming more irregular behind; below this again is a dark band somewhat broken up into spots in front, passing over the shoulder, and continued as a line of large spots along the side. The back is chiefly brownish black, crossed by six narrow transverse whitish bands, the first five equidistant, the foremost communicating with the mesial neck band, and the hinder all uniting with the white band on the side, so as to break up the dark colour into large spots. There are small black spots on the fore neck, lower portion of the sides, and outside of the limbs, the spots on the fore neck forming an imperfect gorget. The white rings on the tail are not much more than half the breadth of the dark rings; the last dark ring, near the tip, and the first white ring are narrower than the others. Nose dark brown mixed with grey, a dark ring round each orbit with a streak running back to below the ear and another passing up to the crown; forehead between and behind the eyes, and in front of the ears, and cheeks, pale grey. Ears rounded and clad with blackish hairs outside and near the margin inside, a few long pale hairs on the inner surface of the ear conch. Whiskers long, extending to behind the ears, the upper brown, the lower entirely white. Soles, except the pads, which are naked, covered with fine hair.

The fur is soft and short throughout, that on the upper parts is ashy grey at the base; lower fur very fine, tips of the longer hairs black or white; none of the hairs are more than half an inch long on the back, being much shorter than in *P. pardicolor*.

The following dimensions are taken on a fully adult male specimen preserved whole in spirit. The length of the body would perhaps be an inch or two more in a fresh specimen, the other dimensions are probably unaltered.

	inches.
Length from nose to rump over curve of back,	18·25
" of tail without the hairs at the end,	16·
" of hairs at end of tail,	0·75
	Total
	35.
Length from nose to rump in a straight line,	16·75
Height at shoulder* about,	6·
Hind foot and tarsus from toe to tarsal joint,	2 8
Length of ear from orifice,.....	1·05
" " from base of helix,	1·1
" " outside from crown of head,	0·65
" from orifice of ear to eye,.....	1·2
" from anterior angle of eye to nostril,	0·97
Longest whisker,	3·6

The skull of the same specimen measures :

	in.	metre
Length from occipital plane to anterior end of premaxillæ,...	3.	·076
" from inferior margin of <i>foramen magnum</i> to do.,.....	2·9	·073
Greatest breadth across zygomatic arches,	1·5	·038
Breadth of brain case at posterior termination of zygomatic arches,	1·	·025
Least breadth of brain case behind post-orbital processes, ...	0·45	·0115
Length of suture between nasal bones,	0·62	·015
" of bony palate from opening of posterior nares to incisors,	1·4	·035
Breadth between posterior molars,	0 53	·013
Length of mandible from angle to symphysis,	2·05	·0515
Height of ditto,.....	0·8	·020

The stuffed skin was most carefully set by Mr. Davison himself, the dimensions being made exactly the same as those taken on the body before skinning. The present measurements are—nose to insertion of tail 19 inches, tail with hair 16½ in., total 35½, nearly the same as in the specimen in spirit. It is probable that this skin also has contracted a little in drying.

This species appears well distinguished from *P. gracilis* and *P. pardicolor* by its larger size, and by the much greater prevalence of dark colour on the upper surface generally. In external characters *P. maculosus* is nearer to the Malay species, *P. gracilis*, the Himalayan *P. pardicolor*

* Measured from the posterior foot pad to the top of the back between the shoulders, the leg being straight.

having the upper parts covered with comparatively small spots, and more numerous rings on the tail.* With *P. gracilis* I am only acquainted by description and figures.† Judging by these, the principal difference in the colouration is that, in *P. gracilis*, the pale tint prevails very much more than in *P. maculosus*, the upper parts of the former being marked by irregularly shaped blackish spots on a pale ground, whereas the upper surface of the latter is dark, with a few white streaks dividing the colour into patches. On the tail of *P. gracilis* the dark rings are represented as narrower, and, towards the tip, much narrower than the white rings, and there is a long white tip. In *P. maculosus* the dark tail rings are nearly twice as broad as the light, and the white tail tip is very short, shorter than the last dark ring. The distribution of colour on the head also appears different, the whole nasal region in front of the eyes being dark in *P. maculosus*, but not in the figure of *P. gracilis*. The more important dimensions of *P. gracilis* as given by Horsfield are; length of the body from the extremity of the nose to the root of the tail 1 ft. $3\frac{1}{2}$ in., length of tail 1 ft. $\frac{1}{2}$ in. It is probable these measurements are from a stuffed specimen, but the much smaller size of *P. gracilis* is shewn by the dimensions of the skull given by Dr. Gray‡ whose measurements of the two species *P. gracilis* and *P. pardicolor* are the following. Those of *P. maculosus* are appended for comparison.

	<i>P. gracilis.</i>	<i>P. pardicolor.</i>	<i>P. maculosus.</i>
Length of skull,	2" 7"§	2" 6"	3"
Width at brain case,.....	11"	10 $\frac{1}{2}$ "	1"
Width of zygomatic arch,	1" 3 $\frac{1}{4}$ "	1" 2 $\frac{1}{2}$ "	1" 6"

This gives the idea that the skull of *P. maculosus* is longer and that the breadth across the zygomatic arches is greater in proportion to the width of the brain case than in the other two species, and judging from an imperfect skull of *P. pardicolor* in my possession, this is the case. I think it probable that *P. maculosus* is a much more powerful animal than either of the other species. The nose is proportionally narrower, more pointed and shorter in *P. pardicolor*, and the bony palate extends a shorter distance behind the posterior molars. From the opening of the posterior nares to the anterior palatal foramina the distance is 0.93 inch in *P. pardicolor*, 1.27 in *P. maculosus*, the form and position of the foramina being similar in the two.

* Jerdon, Mam. Ind. p. 124, says eight or nine. I count ten pale rings besides the whitish tail tip on two Sikkim specimens, received from Mr. Mandelli. The rings near the base and tip of the tail are narrower than in the middle.

† *Felis gracilis*, Horsfield. Res. in Java. This work is not paged, and the plates are not numbered. The animal is described and figured, and the head, feet and dentition are separately represented on another plate.

‡ Cat. Carn. &c., Mam. Brit. Mus. 1869.

§ In the original 1" 7" but this is, I think, clearly a misprint for 2" 7".

The first specimen of this species (a very beautiful and perfect skin) was obtained by Mr. Davison at Bánkasún in Southern Tenasserim. The animal was caught in a trap. The second specimen was procured by Mr. Limborg to the East of Moulmain.

Martes flavigula.

Blyth, J. A. S. B., XXVI, p. 316; XLIV, Pt. 2, extra number, p. 29:—Jerdon, Mam. Ind. p. 82.

A skin belonging to the Malayan race, distinguished from the Himalayan form by the crown of the head and nape being brown instead of black, by wanting the white chin, and by the fur being shorter, was obtained at Bánkasún in Southern Tenasserim by Mr. Davison. The Himalayan form is recorded from Arakan by Mr. Blyth, so that both are found in British Burma.

RODENTIA.

Sciurus rufigenis, Pls. VII, VIII.

W. Blanf. Proc. As. Soc. Bengal, March 1878, p. 93.

S. medius, *S. atridorsalem canicemque magnitudine subæquans, sed caudâ corpore cum capite paullo brevior, rostro longo; superne fusco-olivaceus, punctiunculis minutis nigris fulvisque variatus, subtus albus, maculâque albâ post aurem utram signatus, fronte rufescente, genis ferrugineis, mystacibus nigris, caudâ distichâ, superne canâ, pilis nigris albo-terminatis atque semel annulatis indutâ, subtus castaneâ. Long. corporis a rostro ad anum 8, caudæ, pilis ad extremitatem non inclusis 6·5, plantæ sine unguibus 1·8.*

Hab. in sylvis densis, ad latera montis Muleyit dicti, in provinciâ Tenasserim Burmanicâ, (Davison, Limborg).

This squirrel is nearly the same size as *S. caniceps* and *S. atrodorsalis*, but the tail is much shorter, its length, without counting the hairs at the end, being always considerably less than that of the head and body; it is distinctly distichous below. Fur soft throughout.

Upper parts dark olive, frizzled, cheeks ferruginous, a small white spot behind the ear, lower parts white, tail hoary, black with white rings and tips above, chesnut below.

The colour of the back and sides resembles that of specimens of *S. caniceps* in which there is no yellow or rufous tinge, being a fine mixture of black and pale yellow, the sides rather paler. The fur on the back, as in several allied species of squirrel, is of two kinds, the finer and shorter hairs being dark leaden colour at the base, pale yellowish grey at the tips, and about a quarter of an inch long in the middle of the back, the longer hairs are coarser, about half an inch long, and black with a pale yellow ring near

the end, the tips being black. As usual the longer hairs are most abundant near the middle of the back, less so on the sides. Forehead rufous mixed with black, the sides of the head are dark ferruginous above, paler below, shading off gradually into the colour of the face and throat. Ears rounded, covered thinly inside and out with short hairs; a little patch of silky white hair behind each ear is concealed by the ear cone when the ears are laid back.* Whiskers black. The hairs of the lower parts are dark grey at the base, white at the ends, there is a tinge of rufous on the fore neck and throat in some specimens. Fore limbs yellowish olive outside, like the sides, whitish inside, hind limbs also whitish within, but more rufous outside. Tail clad above with black hairs, having a white ring near, but not at their base, and white tips, so as to produce a very beautiful hoary appearance, lower surface of the tail chesnut, the longer hairs on the sides with black and white tips

The following dimensions in inches were taken by Mr. Davison on fresh specimens :

	♂	♀ ad.	♀ ad.
Length from nose to insertion of tail,.....	7·3	8·2	8·1
„ of tail without hairs at end,	5·7	6·0	6·5
„ of hairs at end of tail,	1·5	2·1	1·3
Total	14·5	16·3	15·9
Length of fore foot (palma) (claws not measured),.....	1·15	1·1	1·1
Length of hind foot from heel without claws,	1·75	1·85	1·8
Height of ear outside,	0·5	0·5	0·55
„ inside from orifice,	0·8	0·8	0·8

The skull (Plate VII) differs considerably from those of *S. lokrioides*, *S. atridorsalis*, *S. caniceps*, *S. phayrei*, *S. blanfordi* and all other allied species with which I have been able to compare it, in the narrow and singularly elongate nasal portion, in which character the present species shews an approach to *Rheithrosciurus* of Gray.

The following are the dimensions of the skull of the present species, compared with those of some of the other Himalayan and Burmese forms.

	<i>S. rufigenis.</i>	<i>S. lokrioides.</i>	<i>S. atridorsalis.</i>	<i>S. caniceps.</i>
	♂ ad.	♀ ad.	♂ ad.	♂ ad.
Length from occiput to end of nasals,...	2·07	1·85	1·95	2·33
Breadth across zygomatic arches,.....	1·2	1·06	1·18	1·37
„ of brainpan at posterior termination of zygomatic arches,	0·95	0·9	0·93	1·02

* This white mark is represented too large in the plate.

	S. rufige- nis.	S. lokri- oides.	S. atridor- salis.	S. cani- ceps.
Breadth across behind post orbital processes,	0·75	0·65	0·7	0·82
„ of frontals between orbits,	0·62	0·63	0·75	0·9
Length of suture between nasal bones,...	0·62	0·53	0·52	0·73
„ of upper row of molars,	0·42	0·36	0·37	0·44
„ of bony palate behind incisors,...	0·9	0·82	0·82	1·
Width of bony palate between posterior molars,	0·27	0·24	0·23	0·3
Length of mandible from angle to symphysis,.....	1·	0·96	1·05	1·25
„ of row of lower molars,.....	0·42	0·37	0·38	0·44

Four specimens of this squirrel were obtained by Mr. Davison at the end of January and beginning of February 1877; all were procured in dense forest, at an elevation of above 5000 feet, on the sides of Mooleyit, a lofty mountain east of Moulmain on the range separating the Hougda-rau from the Thoug Yin valley. A single specimen was subsequently procured in the same locality by Mr. Limborg and this was the first to reach me.

None of the other Burmese or Himalayan squirrels resemble the present form, nor am I acquainted with any Malay species with similar colouration. The nearest approach is perhaps made by *S. pernyi*, found at Szechuen in China.* This species has a yellow spot behind the ear, the lower surface of the tail is ferruginous, and the belly white, but it wants the ferruginous cheeks, it has no white tips to the hairs in the upper surface of the tail, and it is more rufous above, the latter character being, however, of little or no importance.

The Himalayan *Sciurus lokriah* also possesses, I find, the small whitish tuft behind the ear, though less developed than in *S. rufigenis*; the colouring of the lower parts and tail are, however, conspicuously distinct in the two forms. The presence of the white spot in *S. lokriah* affords an excellent character for distinguishing this species from *S. lokrioides*.†

* Milne Edwards, Rev. et Mag. Zool. 1867, p. 230, pl. 19.

† According to Gray, A. M. N. H. Ser. 3, XX, pp. 274, 281, the true *S. lokrioides* of Hodgson is the species with a black tail tip, *S. assamensis* of McClelland and Blyth. The species called *S. lokrioides* by all Indian naturalists is re-named *Macrozue similis* by Gray. As Hodgson's types are in the British Museum and are quoted by Dr. Gray, he may be right, though it is very remarkable that he should be, because the species commonly referred to *S. lokrioides* abounds in Nepal, where Hodgson of course collected it, whilst I doubt if *S. assamensis* be found there. Dr. Anderson has especially examined the British Museum specimens, and will I believe clear up these difficulties.

Sciurus atridorsalis.

Gray, Ann. Mag. N. H., 1842, Ser. 1, Vol. X, p. 263; 1867, Ser. 3, Vol. XX, p. 284;—Blyth, J. A. S. B. XXIV, p. 477; XXVIII, p. 276; XLIV, Pt. 2. Extra number, p. 36;—Beavan, P. Z. S. 1866, p. 428.

This is certainly the most variable of the Burmese squirrels. The back varies in colour from dark speckled grey, with scarcely a tinge of fulvous, to grizzled rufous tawny, the head being in the former case the same colour as the back, or slightly rufescent, in the latter distinctly ferruginous, the ears being usually even deeper rufous than the forehead. Occasionally the whole back from the nape to the insertion of the tail, is black; more commonly there is a black patch from between the shoulders to the rump, but frequently the area of black is shorter and narrower, and occasionally, especially in the more rufous specimens, not a trace remains. The whiskers are sometimes entirely white, sometimes all black, occasionally mixed white and black. The tail is normally grey like the sides, with more or less distinct transverse bands, due to the hairs being ringed greyish white and black, but in some specimens all the hairs are black except at their extreme tip, and in others, they are entirely pale rufous, save at the extreme base, and even this amount of dark colouration disappears towards the tip of the tail. The lower surface, including the breast, abdomen and inside of the limbs is normally rich bay, but sometimes chesnut, pale ferruginous or even pale rufescent, in the dark rufous form the red sometimes extends to the throat, in other cases the lower neck is grey, or the whole central portion is pale rufous, and only the lateral parts bay, especially on the breast. I have two specimens also in which the middle of the breast and abdomen is grizzled like the sides and throat, the lateral portions of the lower parts alone being bay. This shews a complete passage into *S. gordonii**: it is true that in the latter, so far as I know, there is no black on the back, but as this peculiarity is not constant is true *S. atridorsalis*, the distinction is evidently insufficient. The paler under parts may possibly be due to immaturity; with this exception however I cannot find that the variations I have mentioned are due to either sex or age. All specimens from Myawadi appear to have black whiskers, and all from Moulmain white, but from Kaukaryit, on the Hougndarau river, south of Myawadi, I have both forms. I am indebted to Mr. Hume for a superb series of this species and of *S. caniceps*, and I have also a considerable number of both from the collections made by Mr. Limborg. These two are in fact the commonest squirrels of Tenasserim.

The following are measurements by Mr. Davison :

* Anderson, P. Z. S., 1871, p. 140.

	1	2 ♂ juv.	3 ♂	4 ♀ ad.	5 ♂ ad.	6 ♂ ad.
Length from nose to anus,.....	8·	8	8·5	8·65	8·9	7·62
„ of tail from anus,	7·5	7·9	7·4	7·7	7·75	8·3
„ of hairs at end of tail,.....	2·5	2·5	2·7	2·4	2·5	2·
Total	18·0	18·4	18·6	18·75	18·15	17·92
Length of fore foot (without claws),	0·82	1·15	1·18	1·2	1·2	1·19
„ hind foot and tarsus (do.),	1·55	1·85	1·7	1·8	1·9	1·8
Height of ear outside,.....		0·5	0·55	0·4	0·5	0·55
„ inside from orifice,	0·55	0·65	0·71	0·9	0·92	0·68

Some measurements of spirit specimens differ but little from the above.

I have only seen *S. atridorsalis* from the northern portion of the Tenasserim provinces, the species has not yet, so far as I am aware, been recorded from Mergui or Tavoy, nor is it known to occur west of the Salween river. It abounds around Moulmain and Amberst, and in the valleys of the Hougndarau and Attaran rivers.*

S. phayrei.

Blyth, J. A. S. B., XXIV, 1855, p. 476; XLIV, Pt. 2, Extra number, p. 36;—Peters, P. Z. S. 1866, p. 429,—Gray, Ann. Mag. Nat. Hist. Ser. 3, XX, p. 277.

S. hyperythrus, Blyth, J. A. S. B., XXIV, p. 474.

This species, as noticed by Blyth, is only known to occur west of the Salween. It is not, so far as I am aware, found west of the Sitoung; in the Irawadi valley in Pegu, it appears to be replaced by *S. pygerythrus*, whilst further north, around Ava, it is represented by the closely allied *S. blanfordi*, into which it doubtless passes. *S. phayrei*, Mr. Davison tells me, is found north as far as Pah-Khyoung at the southern extremity of Kareni; (the country of the Red Karens).

The following are dimensions of a female from Thatone:

	in.
Length from nose to anus,.....	9·6
„ of tail from anus,	8·8
„ of hairs at end of tail,	2·3
Total	20·7
Length of fore foot (without claws),.....	1·2
„ of hind foot and tarsus (do.),	1·8
„ of ear outside,	0·5
„ „ inside from orifice,	0·7

* Error is proverbially immortal, and consequently, attention cannot be too frequently called to the circumstance that the localities assigned to this species and to many other Asiatic squirrels in Dr. Gray's lists are incorrect.

S. caniceps.

Gray, Ann. Mag. Nat. Hist. 1842, Ser. 1, Vol. X, p. 263; Ser. 3, XX, p. 280; Blyth, J. A. S. B., 1876, XLIV, Pt. 2, Extra number, p. 36.

S. chrysonotus, Blyth, J. A. S. B., XVI, p. 873; XXIV, p. 474.

S. concolor, Blyth, J. A. S. B., XXIV, p. 474.

Although there is nothing like the variation in colouring in this species that there is in *S. atridorsalis*, still a wide difference is found between different specimens, especially in the colouration of the upper parts, as Blyth and Gray have noticed; some having the back pale ferruginous, whilst others have the whole upper surface dull olivaceous grey, minutely punctulated with scarcely a trace of rufous. The most rufous specimens I have seen are from the Hounghdarau valley, east of Moulmain, in these the crown of the head, the back from the nape to the commencement of the tail and the sides are pale rusty red with scarcely a trace of punctulation. Moulmain specimens, as a rule, are punctulated and merely washed with rufous, especially on the anterior part of the back, or the rufous tinge is very faint, and sometimes wanting. Blyth has noticed* that the least rufous specimen he had seen came from Mergui. Southern Tenasserim specimens, judging from one skin collected by Mr. Davison in Tavoy, and several from Bánkasún, want the ferruginous tinge entirely. To the Bánkasún specimens I will refer further presently.

There is also some variation in the colouration of the abdomen. Some specimens are almost white below, others more or less cinerous and more or less punctulated. In some the colour of the lower parts is olivaceous grey, scarcely paler than the sides. In very many specimens there is a dark mesial line more or less developed, but it is not constant. These differences of colouration in the under surface are apparently quite independent of the degree to which the upper parts are washed with rufous, and none of the differences, so far as I can judge, are due to age or sex.

The specimens from Bánkasún in the extreme south of the Tenasserim provinces are decidedly darker, both above and below, than any I have examined from farther north, much darker even than the Tavoy specimen. The Bánkasún skins are almost olive green above, distinctly punctulated, and scarcely paler but rather greyer below. In two specimens out of three there is a darker mesial line beneath. The only difference between these skins and *S. concolor* of Blyth from Malacca, of which species I have examined the type in the Indian Museum, consists in the latter having a slight rufous wash on the upper surface. I have no doubt that the Bánkasún squirrel passes into the Malaccan *S. concolor*. These dark olivaceous forms may perhaps be sufficiently distinct to constitute a local

* J. A. S. B., 1855, XXIV, p. 475,

race, for which Blyth's name may be retained, but they are not, I think, really separable from *S. caniceps*.

The following dimensions in the flesh of two adult females, are taken from Mr. Davison's tickets; both specimens are from Kaukaryit in the Hougdarau valley. I also add (3 and 4) the measurements of two spirit specimens from Mr. Limborg's collection.

	1 ♀	2 ♀	3 ♂	4 ♀,
Length from nose to anus,	8·2	8·7	9·25	8·75
„ of tail from anus,	9·2	9·8	7·75	9·25
„ of hairs at end of tail,	2·5	2·3	3	3·25
	Total	19·9	20·8	20·
				21·25
Length of fore foot (without claws),.....	1·2	1·2	1·32	1·22
„ of hind foot and tarsus (do.),	1·8	1·85	2·	2·05
Height of ear outside,	0·4	0·52	0·45	0·45
„ inside from orifice,	0·8	0·9	0·83	0·8

S. caniceps ranges throughout the Tenasserim provinces from Moulmain to the banks of the Pakchoung. I have also one specimen labelled from Thatone, which is to the west of the Salween, but the skin so precisely resembles the peculiarly dark olive specimens from Bánkasún that I am inclined to suspect the label must have been changed by accident.

S. mouhoti.

Gray, P. Z. S., 1861, p. 137.

S. berdmorei, Gray, Ann. Mag. Nat. Hist. Ser. 3, XX, p. 279. (? an *S. berdmorei verus* Blyth.)

Several skins were procured by Mr. Davison, and a specimen in spirit was collected by Mr. Limborg, of a species of striped squirrel differing somewhat from the Museum specimens of *S. berdmorei*, but agreeing very well with Gray's description of *S. mouhoti* from Camboja.* The museum specimens of *S. berdmorei*, said by Blyth† to have been collected by himself in Martaban‡, have three broad black stripes along the back, whereas in the specimens before me there are no black stripes and no distinct darker

* Especially with the second description quoted above from the 'Annals and Magazine of Natural History.' In the original description the interspace between the pale lateral lines was said to be black, in the second account blackish, which accords better with Mr. Davison's specimens. The remark appended to the original description of *S. Mouhoti*, that it differs from most squirrels of the same size by having the three streaks on the upper part of the back, I understand to refer to the lateral bands, a dark one between two pale stripes, on the upper part of the side, not on the lower as in *S. vittatus* and its allies.

† Cat. Mam. Mus. As. Soc. p. 106.

‡ J. A. S. B., 1862, XXXI, p. 333.

band in the middle of the back, although there is a slight indication of darkening in one specimen. In the original description of *S. berdmorei*,* it was said to have an obscure pale central dorsal streak, flanked by a blackish band, but in a subsequent description† of an example sent from Moulmain the three black bands of the back were especially noticed. Subsequently *S. mouhoti* was described by Gray and then identified by the describer with *S. berdmorei*, an identification adopted by Blyth.‡ It is possible that the two forms pass into each other, but they look very different, and for the present I prefer retaining Gray's name for the variety before me, of which the following is a description.

The upper surface is yellowish brown, punctulated, the hairs being black with two buff rings. The fine woolly under-fur is dark slate-coloured at the base with buff tips. On each side of the back there are two longitudinal pale lines extending from the shoulder to the thigh, the upper narrow and well defined, the lower broader and less marked. Between the two and above the upper pale line, the fur is darker in some specimens, but apparently this is not constant. The sides below the lower pale lateral bands are greyish brown punctulated. The lower parts throughout are white, sometimes tinged with buff. The tail hairs are light brown at the base, then black, then brown again, then black to near the tips, which are whitish. Whiskers black. The ears are rounded with very short hairs outside.

The bare planta on the hind feet extends further towards the heel than in the more typically arboreal squirrels, *S. caniceps*, *S. atridorsalis* and *S. phayrei*, in which the bare portion ends about $\frac{1}{2}$ to $\frac{1}{3}$ of an inch from the proximal extremity of the tarsus, whereas in *S. mouhoti* it extends to the joint. The claws too in *S. mouhoti* are rather less curved, and the pads on the feet appear more raised.

The following are measurements in inches taken by Mr. Davison, before skinning, on two females, the first from Kaukaryit, the second from Myawadi, both east of Moulmain, and of the male preserved by Mr. Limborg in spirit.

	1 ♀	2 ♀	3 ♂
Length from nose to anus,	7·3	6·8	6·4
„ of tail from anus,.....	5 8	5·6	5·4
„ of hairs at end of tail,	2·	2·	
Total	15·1	14·4	

* J. A. S. B., 1849, XVIII, Pt. 1, p. 603.

† J. A. S. B., 1859, XXVIII, p. 418.

‡ J. A. S. B., 1875, XLIV, Pt. 2, Extra number, p. 37.

	1 ♀	2 ♀	3 ♂
Length of fore foot (without claws),.....	0·88	0·85	0·85
„ hind foot and tarsus (do.),	1·53	1·5	1·65
Height of ear outside,.....	0·4	0·5	0·35
„ inside from orifice,	0·8	0·8	0·65

Blyth in his list of the Mammals of Burma, suggests that *S. berdmorei* should perhaps more properly range as a species of *Tamias*. In the specimen of *S. mouhoti* in spirit, obtained by Mr. Limborg, I cannot detect any cheek pouches. Unfortunately the skull of this specimen is too much injured to be extracted for measurement.

The only specimens of this squirrel hitherto obtained are from the country east of Moulmain. Mr. Davison informs me that he has never seen either this or *S. berdmorei* in Southern Tenasserim. The latter is, however, reported with some doubt by Blyth from Mergui.

S. barbei.

Blyth, J. A. S. B., XVI, p. 875, Pl. XXXVI, fig. 3; XVIII, p. 603; XLIV, Pt. 2, Extra number, p. 38.

The following are the dimensions of three fresh specimens recorded by Mr. Davison: 1 and 3 from Kaukaryit on the HOUNGDARAU river, 2 from MYAWADI.

	1 ♂ ad.	2 ♂ ad.	3 ♀
Length from nose to anus,.....	4·65	4·6	4·7
„ of tail from anus,	5·	4·9	5·
„ of hairs at end of tail,	0·85	1·5	1·
	Total	10·5	11·0
Length of fore foot (without claws),.....	0·75	0·7	0·7
„ hind foot and tarsus (do.),	1·	1·12	1·15
Height of ear outside,.....	0·4	0·45	0·45
„ inside from orifice,.....	0·58	0·6	0·6

This species appears to be found throughout Tenasserim, extending south to Malacca. Specimens from Southern Tenasserim and from Malacca have much darker dorsal bands and shorter ear tufts than those from the neighbourhood of Moulmain. Judging from the specimens before me too, the southern form appears smaller, with a comparatively shorter tail, but I have no fresh measurements. The original types came from Yé, about half way between Moulmain and Tavoy, and probably belonged to the Northern variety.

Pteromys cineraceus.

Blyth, J. A. S. B., XVI, p. 865 ; XXVIII, p. 276 ; XLIV, Pt. 2, Extra number, p. 35.

A fine female skin from Wimpong, 15 miles from Thatone, (west of the Salween) has the tip very little darker than the remainder of the tail, and is easily distinguished from *P. oral* of Southern India by its greyer colour, and by the lower parts being white. The following are the dimensions noted by Mr. Davison on the fresh specimen.

	in.
Length from nose to anus,	18·5
„ of tail from anus,.....	22·5
„ of hairs at end of tail,.....	3·
	Total 44·0
Length of fore foot (without claws),	2·4
„ of hind foot and tarsus (do.).....	3·
Height of ear outside,	1·5
„ inside from orifice,	2·

Rhizomys castaneus.

Blyth, J. A. S. B., XII, p. 1007 ; XLIV, Pt. 2, Extra number, p. 41.

A specimen from Thatone in Martaban, west of the Salween river, and another from, I believe, the same neighbourhood, differ from Arakan and Pegu specimens by having a white spot in the middle of the forehead, as in some other species of the genus. As there appears no other distinction, and as the spot is evidently variable, being far more distinct in one specimen before me than in another, I do not think this form is more than a variety.

Mus robustulus.

Blyth, J. A. S. B., XXVIII, p. 294 ; XLIV, Pt. 2, Extra number, p. 39.

Specimens in spirit from near Maulmain collected by Mr. Limborg do not appear to me distinct from the common tree rat of lower Bengal, *M. rufescens* of Blyth and Jerdon, but not, I think, of Gray, as in the original description by the latter the tail is said to be shorter than the body, whereas in both the Bengal and Burmese rats the tail exceeds the head and body in length. I can see no difference in the skulls of the Bengal and Tenasserim rats.

UNGULATA.

Tragulus napu.

Moschus napu, Raffles, Linn. Trans. XIII, p. 262.

Tragulus napu, A. Milne-Edwards, Ann. Sc. Nat. Ser. 5, II, 1864, pp. 106, 158, Pl. II, fig. 2;—Blyth, J. A. S. B., XLIV, 1875, Pt. 2, Extra number, p. 44; P. Z. S., 1864, p. 483.

T. fuscatus, Blyth, J. A. S. B., XXVII, 1858, p. 278.

T. javanicus, Blyth, Cat. Mam. Mus. As. Soc., p. 155, nec Pallas.

As was suggested by Blyth in his remarks on *Tragulus kanchil*, the larger form of chevrotain is also found in Southern Tenasserim, Mr. Davison having procured an adult and a young animal from Bánkasún. Owing to the extreme confusion which formerly prevailed as to the synonymy of the *Traguli*, the nomenclature and distribution of the different species cannot be said yet to be rightly determined in all cases, but it is clear that two distinct forms are found in the Tenasserim provinces and these forms appear to be the *T. kanchil* and *T. napu* of A. Milne-Edwards' monograph of the *Tragulidæ* in the 'Annales des Sciences Naturelles', as has already been pointed out by Mr. Blyth.

The most striking differences between the two species are,—first, size; *T. napu* being probably thrice the weight of *T. kanchil*;—second, the much stouter limbs of the former; the length of the tarsus and hind foot in two specimens before me of *T. napu* and *T. kanchil* respectively being 5.85 and 4.8, whilst the circumference of each tarsus in the middle is 1.3 and 0.85;—and, third, colouration, especially below. There is but little difference above; both are brown, becoming paler and greyer on the sides, but the dark line from the nape down the back of the neck is much more distinct in *T. kanchil*. The colouration of the throat and belly, however, is very different; in *T. napu* there are five white stripes on the throat, one longitudinal in the middle, and two oblique stripes on each side, the upper lateral band being much shorter than the lower. In the adult skin from Tenasserim all these bands unite in front, but not in the young specimen, in which the median stripe is separated from the others, as described by Milne-Edwards. The interspaces between the white bands are dark brown, darker than the sides of the neck, but this appears sometimes to be the case in *T. kanchil* also. The abdomen in adult *T. napu* is mostly white, the breast and the space between the thighs purer white than the rest; in the young all the middle portion of the abdomen between the broad white breast and the narrower white groin is smokey brown; in both there is a rudimentary dark median band, not nearly so distinct as in *T. kanchil*.

In *T. kanchil* there are but three white stripes on the throat, the median line being sometimes entirely distinct from the two broad and long

oblique lateral stripes, sometimes coalescing with them in front; the abdomen is pale rufous and white in patches, the centre of the anterior portion and the sides of the posterior portion being white, and the remainder rufous, but the proportion of the two colours varies; there is, however, a well marked dark median line along the anterior half beginning from the dark transverse band on the breast.

In both species the rump is rufous, and the tail brown above, white below and at the tip. All the differences noticed, except the number of white stripes on the throat, have already been pointed out by Blyth.

XI.—*List of Hymenoptera obtained by MR. OSSIAN LIMBORG east of Maulmain, Tenasserim Provinces, during the months of December 1876, January, March and April 1877, with descriptions of new species:—by FREDERICK SMITH, Biological Department, British Museum. (Communicated by J. WOOD-MASON.)*

(Received 30th August, 1878.)

Scoliadæ.

1. ELIS LINDENI, St. Fargeau, Hym. III, 500.
2. LIACOS ANALIS, Fabr.

Pompilidæ.

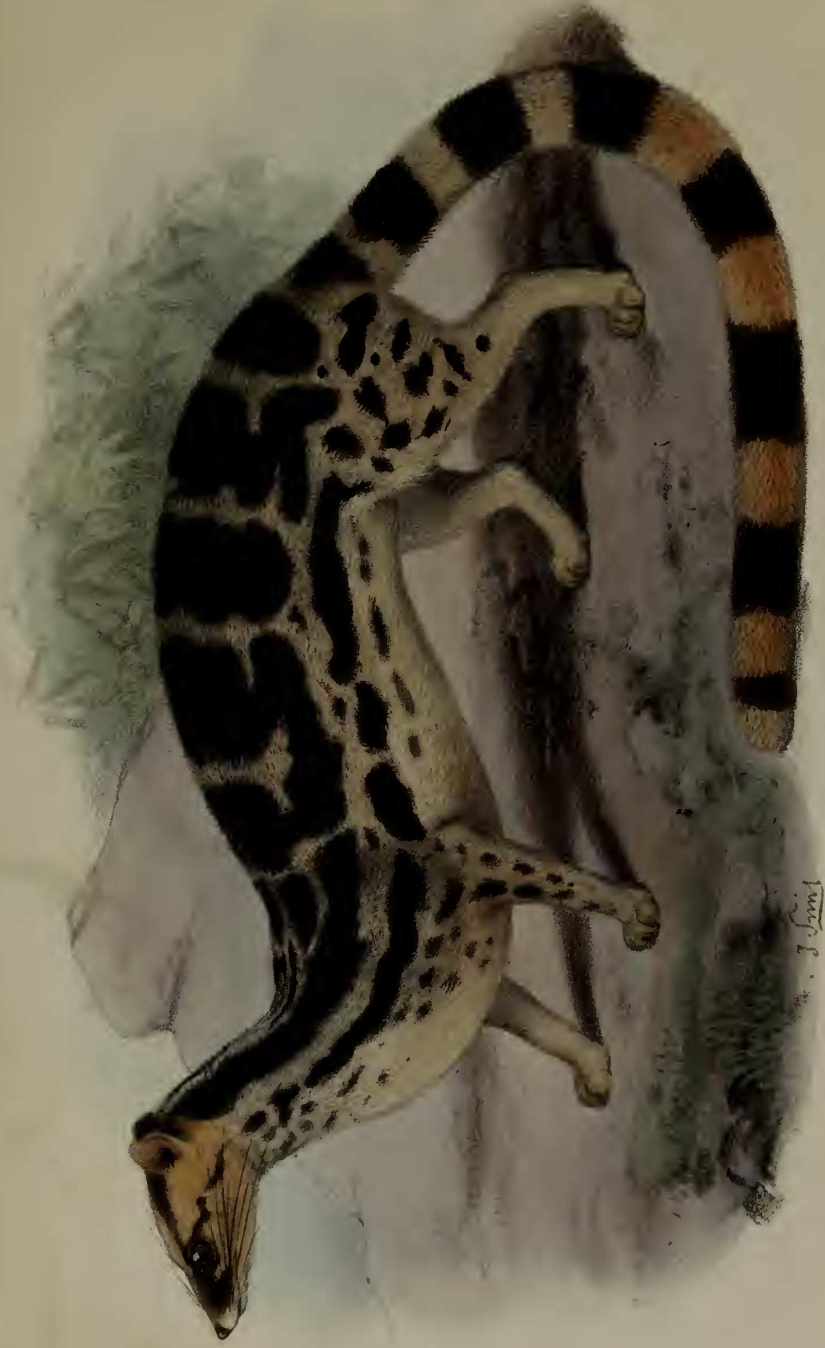
3. POMPILUS PEREGRINUS, Smith.
4. POMPILUS VITIOSUS, n. sp.

Male. Ferruginous: the thorax with black markings, and the abdomen fusco-ferruginous towards the apex. The antennæ fuscous above; the eyes and tips of the mandibles black; the front, before the antennæ, pale reddish yellow. The mesothorax with a black longitudinal stripe on each side; the thorax at the sides and beneath paler than the disk, and with a golden lustre; the pectus black; wings fusco-hyaline. The extreme base of the abdomen black; the first, second and third segments with their apical margins fusco-ferruginous, the following segments entirely so.

Length $6\frac{1}{2}$ lines.

Sphegidæ.

5. AMMOPHILA NIGRIPES, Smith, Cat. Hym. Ins., Pt. IV, p. 215.
6. CHLOBION LOBATUM, Fabr., Ent. Syst., II, p. 206.



J Smit hth

Hanhart imp

PRIONODON MACULOSUS



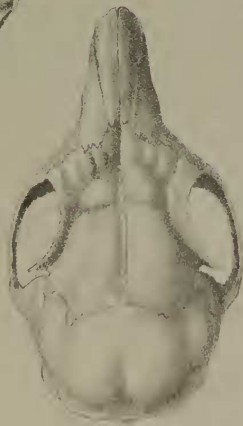
1.



2.



3.



4.

1. 2. 3. PRIONODON MACULOSUS.
4. SCIURUS RUFIGENIS.



J. Smith lith

Hanhart imp

SCIURUS RUFIGENIS